CLAIMS:

1. A photo-induced thermally developable film comprising:

a polymer matrix having a first refractive index;

at least one monomer compatible with the polymer matrix and having a second refractive index different from the first refractive index;

a procatalyst; and

a cocatalyst, where the cocatalyst is suitable for converting the procatalyst to a latently active form upon exposure to actinic radiation and the latently active form is convertible to an active form upon heating to a first temperature.

2. The photo-induced thermally developable film of Claim 1, where the procatalyst is convertible to an active form without exposure to the actinic radiation upon heating to a second temperature higher than the first temperature.

3. The photo-induced thermally developable film of Claim 1, further comprising at least one antioxidant.

4. The photo-induced thermally developable film of Claim 1, where the polymer matrix comprises one of a homopolymer, a copolymer and a terpolymer.

5. The photo-induced thermally developable film of Claim 1, where the polymer matrix comprises first repeat units and second repeat units.

6. The photo-induced thermally developable film of Claim 5, where the first repeat units comprise alkyl norbornene repeat units and the second repeat units comprise norbornene-type repeat units.

7. The photo-induced thermally developable film of Claim 6, where the alkyl norbornene repeat units comprise hexyl norbornene repeat units and the norbornene-type repeat units comprise diphenylmethyl norbornenemethoxy silane repeat units.

8. The photo-induced thermally developable film of Claim 6, where the alkyl norbornene repeat units comprise hexyl norbornene repeat units and the norbornene-type repeat units comprise benzyl norbornene repeat units.

9. The photo-induced thermally developable film of Claim 6, where the alkyl norbornene repeat units comprise hexyl norbornene repeat units and the norbornene-type repeat units comprise phenylethyl norbornene repeat units.

10. The photo-induced thermally developable film of Claim 1, where the at least one monomer comprises at least one norbornene-type monomer.

11. The photo-induced thermally developable film of Claim 10, where the at least one norbornene-type monomer comprises a norbornene-type monomer having an alkyl pendant group.

12. The photo-induced thermally developable film of Claim 10, where the at least one norbornene-type monomer comprises hexyl norbornene and bis-norbornenemethoxy dimethylsilane.

13. The photo-induced thermally developable film of Claim 11, where the polymer matrix comprises hexyl norbornene repeat units and diphenylmethyl norbornenemethoxy silane repeat units.

14. The photo-induced thermally developable film of Claim 1, where the at least one monomer comprises a crosslinker monomer.

15. The photo-induced thermally developable film of Claim 14, where the crosslinker monomer comprises a norbornene-type crosslinker monomer.

16. The photo-induced thermally developable film of Claim 1, where the cocatalyst comprises a photoinitiator.

17. The photo-induced thermally developable film of Claim 16, where the photoinitiator comprises a cationic photoinitiator which produces a cation and a weakly coordinating anion upon exposure to an actinic radiation, and the procatalyst is converted to the latently active form in association with the weakly coordinating anion.

18. The photo-induced thermally developable film of Claim 2, where the procatalyst is represented by the formula $(E(R)_3)_2Pd(Q)_2$, where $E(R)_3$ is a Group 15 neutral electron donor ligand, E is an element selected from the group consisting of elements of Group 15 of the Periodic Table, R in $E(R)_3$ is one of a hydrogen, an isotope thereof, and a hydrocarbyl containing moiety, and Q is an anionic ligand selected from the group consisting of a carboxylate, a thiocarboxylate and a dithiocarboxylate.

19. The photo-induced thermally developable film of Claim 2, where the procatalyst is represented by the formula $[(E(R)_3)_aPd(Q)(LB)_b]_p[WCA]_q$, where $E(R)_3$ is a Group 15 neutral electron donor ligand, E is a Group 15 element, and R independently is one of a hydrogen, an isotope thereof, and an anionic hydrocarbyl containing moiety, Q is an anionic ligand selected from the group consisting of a carboxylate, a thiocarboxylate and a dithiocarboxylate, LB is a Lewis base, WCA represents a weakly coordinating anion, a is an integer of 1, 2, or 3, b is an integer of 0, 1, or 2, where a + b is 1, 2, or 3, and p and r are integers that represent a number of times a palladium cation and the weakly coordinating anion are taken to balance an electronic charge on a structure of

$[(E(R)_3)_aPd(Q)(LB)_b]_p[WCA]_q$.

20. The photo-induced thermally developable film of Claim 19, where p and r are independently selected from an integer of 1 and 2.

21. The photo-induced thermally developable film of Claim 1, where the polymer matrix comprises repeat units, at least some of the repeat units each comprise a cleavable pendent group which is at least partly cleaved from the polymer matrix and removed from the photo-induced thermally developable film as a result of exposure to the actinic radiation and heating to the second temperature, whereby altering the first refractive index.

22. The photo-induced thermally developable film of Claim 21, where the cleavable pendent group comprises at least one component selected from the group consisting of -O-, Si-phenyl and -OSi-.

23. The photo-induced thermally developable film of Claim 1, further comprising a sensitizer.

24. A photo-induced thermally developable film comprising:
a polymer matrix having a first refractive index and including a cleavable pendant group; and
a photoinitiator which produces a cation and a weakly coordinating anion upon exposure to actinic radiation.

25. The photo-induced thermally developable film of Claim 24, further comprising at least one antioxidant.

26. The photo-induced thermally developable film of Claim 24, where the polymer matrix comprises one of a homopolymer, a copolymer and a terpolymer.

27. The photo-induced thermally developable film of Claim 24, where the polymer matrix comprises first repeat units and second repeat units.

28. The photo-induced thermally developable film of Claim 27, where the first repeat units comprise alkyl norbornene-type repeat units and the second repeat units comprise norbornene-type repeat units.

29. The photo-induced thermally developable film of Claim 28, where the alkyl norbornene-type repeat units comprise hexyl norbornene repeat units and the norbornene-type repeat units comprise diphenylmethyl norbornenemethoxy silane repeat units.

30. The photo-induced thermally developable film of Claim 24, further comprising a procatalyst and at least one monomer compatible with the polymer matrix.

31. The photo-induced thermally developable film of Claim 30, where the procatalyst is capable of being converted to a latently active form in association with the weakly coordinating anion and to an active form upon application of sufficient heat, the procatalyst in the active form polymerizing the at least one monomer.

32. The photo-induced thermally developable film of Claim 30, where the at least one monomer comprises at least one norbornene-type monomer.

33. The photo-induced thermally developable film of Claim 32, where the at least one norbornene-type monomer comprises hexyl norbornene and bis-norbornenemethoxy dimethylsilane.

34. The photo-induced thermally developable film of Claim 33, where the polymer matrix comprises hexyl norbornene repeat units and diphenylmethyl norbornenemethoxy silane repeat units.

35. The photo-induced thermally developable film of Claim 32, where the at least one norbornene-type monomer comprises a norbornene-type monomer having an alkyl pendant group.

36. The photo-induced thermally developable film of Claim 30, where the at least one monomer comprises a norbornene-type crosslinker monomer.

37. The photo-induced thermally developable film of Claim 30, where the procatalyst is represented by the formula $(E(R)_3)_2Pd(Q)_2$, where $E(R)_3$ is a Group 15 neutral electron donor ligand, E is an element selected from the group consisting of elements of Group 15 of the Periodic Table, R in $E(R)_3$ is one of a hydrogen, an isotope thereof, and a hydrocarbyl containing moiety, and Q is an anionic ligand selected from the group consisting of a carboxylate, a thiocarboxylate and a dithiocarboxylate.

38. The photo-induced thermally developable film of Claim 30, where the procatalyst is represented by the formula $[(E(R)_3)_aPd(Q)(LB)_b]_p[WCA]_q$, where $E(R)_3$ is a Group 15 neutral electron donor ligand, E is a Group 15 element, and R independently is one of a hydrogen, an isotope thereof, and an anionic hydrocarbyl containing moiety, Q is an anionic ligand selected from the group consisting of a carboxylate, a thiocarboxylate and a dithiocarboxylate, LB is a Lewis base, WCA represents a weakly coordinating anion, a is an integer of 1, 2, or 3, b is an integer of 0, 1, or 2, where a + b is 1, 2, or 3, and p and r are integers that represent a number of times a palladium cation and the weakly coordinating anion are taken to balance an electronic charge on a structure of $[(E(R)_3)_aPd(Q)(LB)_b]_p[WCA]_q$.

39. The photo-induced thermally developable film of Claim 38, where p and r are independently selected from an integer of 1 and 2.

40. The photo-induced thermally developable film of Claim 24, where the cleavable pendent group comprises at least one component selected from the group consisting of -O-, Si-phenyl and -OSi-.

41. The photo-induced thermally developable film of Claim 24, further comprising a sensitizer.

42. An optical waveguide comprising a material layer having a first portion and a second portion laterally adjacent the first portion, where the first portion comprises a first norbornene-type polymer material having a first refractive index, and the second portion comprises a second norbornene-type polymer material having a second refractive index lower than the first refractive index.

43. The optical waveguide of Claim 42, where the first portion comprises an optical waveguide core portion and the second portion comprises an optical waveguide cladding portion.

44. The optical waveguide of Claim 42, where the first and second norbornene-type polymer materials comprise alkyl norbornene repeat units.

45. The optical waveguide of Claim 44, where the alkyl norbornene repeat units are hexyl norbornene repeat units.

46. The optical waveguide of Claim 42, where the first and second norbornene-type polymer materials comprise first norbornene-type repeat units and second norbornene-type repeat units.

47. The optical waveguide of Claim 46, where the first norbornene-type repeat units comprise alkyl norbornene repeat units and the second norbornene-type repeat units comprise norbornene-type repeat units.

48. The optical waveguide of Claim 47, where the alkyl norbornene repeat units comprise hexyl norbornene repeat units and the norbornene-type repeat units comprise diphenylmethyl norbornenemethoxy silane repeat units.

49. The optical waveguide of Claim 47, where the alkyl norbornene repeat units comprise hexyl norbornene repeat units and the norbornene-type repeat units comprise benzyl norbornene repeat units.

50. The optical waveguide of Claim 47, where the alkyl norbornene repeat units comprise hexyl norbornene repeat units and the norbornene-type repeat units comprise phenylethyl norbornene repeat units.

51. The optical waveguide of Claim 43, further comprising a cladding layer positioned vertically adjacent the material layer.

52. The optical waveguide of Claim 51, where the optical waveguide cladding portion of the material layer and the cladding layer surround the optical waveguide core portion of the material layer, and the cladding layer comprises a third norbornene-type polymer material.

53. The optical waveguide of Claim 52, where the third norbornene-type polymer material comprises alkyl norbornene repeat units.

54. The optical waveguide of Claim 53, where the alkyl norbornene repeat units comprise hexyl norbornene repeat units.

55. The optical waveguide of Claim 52, where the third norbornene-type polymer material comprises norbornene-type repeat units having an epoxy pendant group.

56. A method of forming an optical waveguide structure, comprising:

providing a first material layer having a first refractive index and comprising a polymer matrix, at least one monomer compatible with the polymer matrix, a procatalyst, and a cocatalyst, where the polymer matrix and at least one monomer have different refractive indices, the cocatalyst is suitable for converting the procatalyst to a latently active form upon exposure to actinic radiation, and the latently active form is convertible to an active form upon heating to a first temperature;

selectively exposing a first portion of the first material layer to the actinic radiation; and

first heating the first material layer to the first temperature, the first refractive index changing to a second refractive index.

57. The method of Claim 56, where the procatalyst is convertible to an active form without exposure to the actinic radiation upon heating to a second temperature higher than the first temperature.

58. The method of Claim 56, where the cocatalyst comprises a photoinitiator which produces a cation and a weakly coordinating anion upon exposure to actinic radiation, and the procatalyst is converted to the latently active form in association with the weakly coordinating anion.

59. The method of Claim 56, where the at least one monomer comprises a norbornene-type monomer.

60. The method of Claim 56, further comprising providing a second material layer over the first material layer, the second material layer having a third refractive index different from the second refractive index.

61. The method of Claim 60, where the second material layer comprises a polymer matrix, at least

one monomer compatible with the polymer matrix of the second material, a procatalyst, and a cocatalyst, where the cocatalyst of the second material layer is suitable for converting the procatalyst of the second material layer to a latently active form upon exposure to the actinic radiation, the procatalyst of the second material layer is convertible to an active form upon heating to the first temperature, and the procatalyst of the second material layer in the active form polymerizes the at least one monomer of the second material.

62. The method of Claim 61, where the cocatalyst of the second material layer comprises a photoinitiator which produces a cation and a weakly coordinating anion upon exposure to the actinic radiation, and the procatalyst of the second material layer is converted to the latently active form in association with the weakly coordinating anion of the second material layer.

63. The method of Claim 61, where the polymer matrix of the second material layer comprises a norbornene-type polymer comprising a norbornene-type repeat unit having an epoxy pendant group.

64. The method of Claim 57, further comprising second heating the first material layer to the second temperature.

65. The method of Claim 64, further comprising third heating the first material layer to a third temperature at least 20°C higher than the second temperature.

66. The method of Claim 56, where the polymer matrix comprises a norbornene-type polymer.

67. The method of Claim 56, where the polymer matrix comprises first repeat units and second repeat units.

68. The method of Claim 67, where the first repeat units comprise alkyl norbornene repeat units and the second repeat units comprise norbornene-type repeat units.

69. The method of Claim 68, where the alkyl norbornene repeat units comprise hexyl norbornene repeat units and the norbornene-type repeat units comprise diphenylmethyl norbornenemethoxy silane repeat units.

70. The method of Claim 68, where the alkyl norbornene repeat units comprise hexyl norbornene repeat units and the norbornene-type repeat units comprise benzyl norbornene repeat units.

71. The method of Claim 68, where the alkyl norbornene repeat units comprise hexyl norbornene repeat units and the norbornene-type repeat units comprise phenylethyl norbornene repeat units.

72. The method of Claim 56, where the procatalyst is represented by the formula $(E(R)_3)_2Pd(Q)_2$,

where $E(R)_3$ is a Group 15 neutral electron donor ligand, E is an element selected from the group consisting of elements of Group 15 of the Periodic Table, R in $E(R)_3$ is one of a hydrogen, an isotope thereof and a hydrocarbyl containing moiety, and Q is an anionic ligand selected from the group consisting of a carboxylate, a thiocarboxylate and a dithiocarboxylate.

73. The photo-induced thermally developable film of Claim 56, where the procatalyst is represented by the formula $[(E(R)_3)_aPd(Q)(LB)_b]_p[WCA]_q$, where $E(R)_3$ is a Group 15 neutral electron donor ligand, E is a Group 15 element, and R independently is one of a hydrogen, an isotope thereof, and an anionic hydrocarbyl containing moiety, Q is an anionic ligand selected from the group consisting of a carboxylate, a thiocarboxylate and a dithiocarboxylate, LB is a Lewis base, WCA represents a weakly coordinating anion, a is an integer of 1, 2, or 3, b is an integer of 0, 1, or 2, where a + b is 1, 2, or 3, and p and r are integers that represent a number of times a palladium cation and the weakly coordinating anion are taken to balance an electronic charge on a structure of $[(E(R)_3)_aPd(Q)(LB)_b]_p[WCA]_q$.

74. The photo-induced thermally developable film of Claim 73, where p and r are independently selected from an integer of 1 and 2.

75. The method of Claim 56, where the first refractive index is higher than the second refractive index and the first portion of the first material layer comprises at least one cladding portion.

76. The method of Claim 56, where the first refractive index is lower than the second refractive index and the first portion of the first material layer comprises at least one core portion.

77. The method of Claim 56, where the at least one monomer comprises a crosslinker monomer.

78. The method of Claim 77, where the crosslinker monomer is a norbornene-type crosslinker monomer.

79. The method of Claim 56, where the first material layer further comprises an antioxidant.

80. The method of Claim 56, where the first material layer further comprises a sensitizer.

81. The method of Claim 56, where the actinic radiation has a peak wavelength of approximately 200 to 450 nm.

82. The method of Claim 56, where the exposing comprises exposing the first portion of the first material layer to the actinic radiation at an exposure amount of approximately 1 to 9 J/cm^2.

83. The method of Claim 56, where the polymer matrix comprises a cleavable pendant group

which is at least partly cleaved from the polymer matrix and removed from the first material layer as a result of the exposing and first heating.

84. The method of Claim 83, where the cleavable pendant group comprises at least one component selected from the group consisting of -O-, Si-phenyl and -OSi-.

85. The method of Claim 56, where the polymer matrix comprises diphenylmethyl norbornenemethoxy silane repeat units.

86. The method of Claim 56, where the polymer matrix comprises hexyl norbornene repeat units and diphenylmethyl norbornenemethoxy silane repeat units.

87. The method of Claim 60, where the second material layer comprises a polymer matrix and a photoinitiator which produces a cation and a weakly coordinating anion upon exposure to the actinic radiation.

88. The method of Claim 87, where the second material layer further comprises at least one monomer compatible with the polymer matrix of the second material layer and a procatalyst suitable for being converted to a latently active form in association with the weakly coordinating anion and for polymerizing the at least one monomer of the second material layer upon the first heating.

89. The method of Claim 56, where the exposing comprises masking the first material layer with a mask element having an unmasked portion corresponding to the first portion of the first material layer and exposing to actinic radiation.

90. An optical waveguide comprising a waveguide layer having at least one cladding portion and at least one laterally adjacent core portion,

wherein:

the at least one laterally adjacent core portion comprising a first polymer material further comprising first repeat units, each of the first repeat units having a cleavable pendant group; and

the at least one cladding portion comprising the first polymer material, where the cleavable pendant group is at least partly absent from at least some of the first repeat units such that a first refractive index of the at least one laterally adjacent core portion is higher than a second refractive index of the at least one cladding portion.

91. The optical waveguide according to Claim 90, where the first polymer material is a norbornene-type polymer.

92. The optical waveguide of Claim 90, where the first polymer material further comprises second repeat units.

93. The optical waveguide of Claim 92, where the first repeat units comprise hexyl norbornene repeat units and the second repeat units comprise diphenylmethyl norbornenemethoxy silane repeat units.

94. The optical waveguide of Claim 90, where the first polymer material further comprises repeat units of at least one monomer, the at least one monomer has a refractive index lower than the refractive index of the first polymer material, and the at least one cladding portion has a larger concentration of the repeat units of the at least one monomer than the at least one laterally adjacent core portion.

95. The optical waveguide of Claim 94, where the at least one monomer comprises a norbornene-type monomer.

96. The optical waveguide of Claim 94, where the at least one monomer comprises a crosslinker monomer.

97. The optical waveguide of Claim 96, where the crosslinker monomer is a norbornene-type crosslinker monomer.

98. The optical waveguide of Claim 90, where the first polymer material comprises one of a homopolymer, a copolymer and a terpolymer.

99. The optical waveguide of Claim 90, where the waveguide layer further comprises at least one of a procatalyst and a residue thereof.

100. The optical waveguide of Claim 99, where the procatalyst is represented by the formula $(E(R)_3)_2Pd(Q)_2$, where $E(R)_3$ is a Group 15 neutral electron donor ligand, E is an element selected from the group consisting of elements of Group 15 of the Periodic Table, R in $E(R)_3$ is one of a hydrogen, an isotope thereof and a hydrocarbyl containing moiety, and Q is an anionic ligand selected from the group consisting of a carboxylate, a thiocarboxylate and a dithiocarboxylate.

101. The photo-induced thermally developable film of Claim 99, where the procatalyst is represented by the formula $[(E(R)_3)_aPd(Q)(LB)_b]_p[WCA]_q$, where $E(R)_3$ is a Group 15 neutral electron donor ligand, E is a Group 15 element, and R independently is one of a hydrogen, an isotope thereof, and an anionic hydrocarbyl containing moiety, Q is an anionic ligand selected from the group consisting of a carboxylate, a thiocarboxylate and a dithiocarboxylate, LB is a Lewis base, WCA represents a weakly coordinating anion, a is an integer of 1, 2, or 3, b is an integer of 0, 1, or 2, where a + b is 1, 2, or 3, and p and r are integers that represent a number of times a palladium cation and the weakly coordinating anion are taken to balance an electronic charge on a structure of

$[(E(R)_3)_aPd(Q)(LB)_b]_p[WCA]_q$.

102. The photo-induced thermally developable film of Claim 101, where p and r are independently selected from an integer of 1 and 2.

103. The optical waveguide of Claim 90, where the waveguide layer further comprises an antioxidant.

104. The optical waveguide of Claim 90, where the cleavable pendent group comprises at least one component selected from the group consisting of -O-, Si-phenyl and -OSi-.

105. The optical waveguide of Claim 90, further comprising a cladding layer disposed over the waveguide layer.

106. The optical waveguide of Claim 105, where the cladding layer comprises a norbornene-type polymer.

107. The optical waveguide of Claim 90, further comprising a substrate supporting the waveguide layer.

108. A method for forming an optical waveguide structure, comprising:

providing a film having a first refractive index, the film comprising a polymer matrix and a photoinitiator, the polymer matrix comprising repeat units at least some of which have a cleavable pendant group, the photoinitiator capable of producing a cation and a weakly coordinating anion upon exposure to actinic radiation;

selectively exposing a first portion of the film to the actinic radiation; and

heating the film to a first temperature, the cleavable pendent group of the at least some of the repeat units being at least partly cleaved and removed from the first portion as a result of the exposing and heating so as to alter the first refractive index therein to a second refractive index.

109. The method of to Claim 108, where the repeat units comprise a norbornene-type repeat units.

110. The method of Claim 109, where the norbornene-type repeat units comprise hexyl norbornene repeat units and/or diphenylmethyl norbornenemethoxy silane repeat units.

111. The method of Claim 108, where the film further comprises at least one monomer and a procatalyst capable of being converted to a latently active form in association with the weakly coordinating anion and to an active form upon the heating to the first temperature, the procatalyst in the active form polymerizing the least one monomer.

112. The method of Claim 111, where the at least one monomer comprises a norbornene-type monomer.

113. The method of Claim 111, where the at least one monomer comprises a crosslinker monomer.

114. The method of Claim 113, where the crosslinker monomer is a norbornene-type crosslinker monomer.

115. The method of Claim 111, where the procatalyst is convertible to an active form without exposure to the actinic radiation upon heating to a second temperature higher than the first temperature.

116. The method of Claim 115, further comprising heating the film to the second temperature.

117. The method of Claim 116, further comprising heating the film to a third temperature which is at least 20°C higher than the second temperature.

118. The method of Claim 108, where the film further comprises an antioxidant.

119. The method of Claim 111, where the procatalyst is represented by the formula $(E(R)_3)_2Pd(Q)_2$, where $E(R)_3$ is a Group 15 neutral electron donor ligand, E is an element selected from the group consisting of elements of Group 15 of the Periodic Table, R in $E(R)_3$ is one of a hydrogen, an isotope thereof and a hydrocarbyl containing moiety, and Q is an anionic ligand selected from the group consisting of a carboxylate, a thiocarboxylate and a dithiocarboxylate.

120. The photo-induced thermally developable film of Claim 111, where the procatalyst is represented by the formula $[(E(R)_3)_aPd(Q)(LB)_b]_p[WCA]_q$, where $E(R)_3$ is a Group 15 neutral electron donor ligand, E is a Group 15 element, and R independently is one of a hydrogen, an isotope thereof, and an anionic hydrocarbyl containing moiety, Q is an anionic ligand selected from the group consisting of a carboxylate, a thiocarboxylate and a dithiocarboxylate, LB is a Lewis base, WCA represents a weakly coordinating anion, a is an integer of 1, 2, or 3, b is an integer of 0, 1, or 2, where a + b is 1, 2, or 3, and p and r are integers that represent a number of times a palladium cation and the weakly coordinating anion are taken to balance an electronic charge on a structure of $[(E(R)_3)_aPd(Q)(LB)_b]_p[WCA]_q$.

121. The photo-induced thermally developable film of Claim 120, where p and r are independently selected from an integer of 1 and 2.

122. The method of Claim 108, where the actinic radiation has a peak wavelength of approximately between 200 and 450 nm.

123. The method of Claim 108, where the exposing comprises exposing the first portion of the film at an exposure amount of approximately 1 to 9 J/cm^2.

124. The method of Claim 108, where the cleavable pendent group comprises at least one component selected from the group consisting of -O-, Si-phenyl and -OSi-.

125. The method of Claim 108, further comprising providing a second film over the film, wherein the second film comprises a polymer matrix and a photoinitiator, the polymer matrix of the second film further comprises repeat units at least some of which have a cleavable pendant group, and the photoinitiator of the second film produces a cation and a weakly coordinating anion upon exposure to actinic radiation.

126. The method of Claim 125, where the cleavable pendent group of the second film comprises at least one component selected from the group consisting of -O-, Si-phenyl and -OSi-.

127. The method of Claim 108, where the first portion comprises a cladding portion of the optical wave guide structure.

128. The method of Claim 108, where the exposing comprises masking the film with a mask element having an unmasked portion corresponding to the first portion.

129. The method of Claim 108, where the film further comprises a sensitizer.